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## Grades 5-8

### Module 1: Volcanoes: Local hazard, global issue

Detecting change and tracking processes in Earth's systems is an important component of NASA research. This module allows students, like NASA scientists, to explore two ways that volcanoes affect Earth: by directly threatening people and the environments adjacent to them, and by ejecting aerosols into the atmosphere. Through three investigations, students explore issues of volcano hazards at different scales, from their local environment to the global effects of volcanic aerosols on climate and aircraft safety.

Investigation 1: How close is safe? Buffer zone development

Investigation 2: Sensing volcanic effects from space

Investigation 3: Tracking world aerosol hazards



### Module 2: Mars and Earth: The quest for life

This module looks at human systems on Earth by using unique space-based observations. The module begins with investigations of how these observations are obtained and how they are interpreted. Along with Earth, this module studies Mars and the possibility that life existed, or perhaps may still exist, on that planet. The comparison of Earth and Mars is accomplished by identifying and observing similar physical processes that exist on both worlds.

Investigation 1: Where do we choose to live and why?

Investigation 2: How does remote sensing help us to observe human activities on Earth?

Investigation 3: What similar physical processes occur on both Earth and Mars?

Investigation 4: Is life on Mars possible and could humans establish settlements there?

### Module 3: Human footprints on Earth as seen by NASA scientists

The human footprint on Earth's surface is barely perceptible in some areas, whereas it is very intense and highly noticeable in others. The investigations in this module begin with an examination of the spatial and environmental aspects of a shopping mall in Huntsville, Alabama. Next comes a study of Atlanta's urban heat island and the consequences of urban deforestation. Then, students are asked to consider significant environmental changes in different parts of the world. Deforestation in Rondonia, Brazil, provides a case study of a major environmental change.

Investigation 1: Let's go to the mall

Investigation 2: What's hot at the mall?

Investigation 3: Why is the city hot?

Investigation 4: Where in the world are major environmental changes?

## **Module 4: Remote sensing and geoarchaeology: How do remotely sensed images help us to understand past cultures?**

This module explores ways geographers and geoarchaeologists use remote sensing to uncover previously undiscovered sites of human occupation. Photographs have long been used by geoarchaeologists to document sites before and after excavation. In the early 1980s, remote sensing became a tool used to detect human features on the landscape and disturbances of natural features. Students apply remote sensing and map skills to study ancient and prehistoric sites and to locate new ones.

Investigation 1: How does remote sensing help us understand the Anasazi?

Investigation 2: How do geoarchaeologists use remote sensing to interpret landscapes?

Investigation 3: How does remote sensing search for the geographies of the past?